

A FINANCIAL SYSTEM OF COMPUTERS

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Background of the Invention:

This is a continuation of United States Patent application serial number 09/166,749 filed on October 5, 1998, and entitled "Financial System of Computers", which was a continuation of United States Patent application serial number 08/597,017, entitled "An Improved Financial Transactions System" filed February 5, 1996, now United States Patent number 5,822,737, issued on October 13, 1998.

This invention relates generally to financial transactions and more particularly to transactions involving credit or debit cards.

The time is fast approaching where a significant amount of commerce will be conducted using distributed networks of computers such as the Internet. The reason this ground-swell of commerce will occur is the ability of a single merchant to economically reach a vast number of potential customers at substantially no costs. Further, the customers are able to review a great number of vendors and their products with the ease of a few key strokes and clicks of the mouse.

Although there are vast numbers of merchants already using such networks, the sales volume has been particularly low due to a variety of reasons. One reason which has depressed commerce on

1 the networks, is the difficulty with which customers can pay for
2 their purchases.

3 A variety of techniques have been developed to cure this
4 problem ranging from accepting phone orders to the establishment
5 of another currency called "E-Cash".

6 Phone orders in response to merchant promotional materials
7 creates a variety of problems. One major problem is the
8 requirements for phone lines and personnel to receive and process
9 the phone orders. Another hurdle is the simple fact that most
10 customers have a single phone line to their residence and this
11 line is used by the computer for accessing the network; the
12 customer has to disconnect from the network to make the phone
13 order.

14 Although E-Cash is a viable alternative, it is faced with
15 some enormous problems which will be difficult or impossible to
16 address. These include: counterfeiting problems; government
17 reluctance to accept the concept; difficulties in getting access
18 for handling E-Cash; and, the low number of users and merchants
19 which can use E-Cash.

20 It is clear from the foregoing that there is a need for an
21 efficient methodology and system to accept payment over
22 distributed computer networks.

1 Summary of the Invention:

2 The present invention contemplates a totally automated
3 system for securing payment via a distributed network of
4 computers. In this context, the invention creates an automated
5 payment system particularly suited for purchases over a network
6 such as the Internet.

7 Although the present invention is described relative to the
8 Internet, its application is not so limited and is intended to be
9 used on any distributed computer system in which merchants and
10 consumers interact for the purpose of supplying and purchasing
11 goods or services.

12 In such a distributed computer network, a merchant or
13 vending computer contains certain promotional information which
14 is communicated to a customer's computer. This information is
15 intended to give the customer sufficient information to make a
16 decision on if the goods/services are acceptable.

17 As used within this discussion, the term "merchant computer"
18 signifies a computer system which is used for the purpose of
19 selling goods or services. The vendor itself does not
20 necessarily own the computer; in some situations, the computer is
21 operated on behalf of the merchant or vendor.

22 Based upon the promotional information, the
23 consumer/operator of the customer's computer decides to purchase
24 the services or goods described by the promotional information.

25 It is at this point where the present invention is
26 particularly powerful as it provides a simple, easy, methodology

1 and linkage for the customer to pay for the goods/services.

2 In this context, the customer's computer is linked to a
3 payment processing computer and the customer's credit card number
4 and the amount of the goods or services is transmitted to the
5 payment processing computer. For security reasons, an encrypting
6 software package is first downloaded to the customer's computer
7 so that the credit card number is secure from "hackers" who might
8 also be on the network.

9 Although the term "credit card" is used, the invention
10 covers the use of any type of financial guarantee card such as
11 automatic debit accounts, checking account numbers, savings
12 account numbers, and other such devices obvious to those of
13 ordinary skill in the art.

14 The payment processing computer automatically contacts a
15 bank for verification of the credit card and amount; the bank
16 transmits an authorization to the payment processing computer.
17 This authorization, usually in the form of a number, is stored
18 within the payment processing computer's memory for later
19 reference.

20 The link of connection with the bank is terminated by the
21 payment processing computer and the payment processing computer
22 turns its attention to the customer's computer. The payment
23 processing computer communicates a self-generated transaction
24 indicia, and in some embodiments a password, to the customer's
25 computer.

26 The transaction indicia is generated by the payment

1 processing computer for proper record keeping. The transaction
2 indicia is also used by the customer to verify that an order has
3 been generated and accepted.

4 The password is defined by the merchant's computer for the
5 payment processing computer to pass along to the customer's
6 computer. The password is used by the customer's computer to
7 gain access to restricted material within the merchant's
8 computer.

9 As example, assume the merchant's computer is supplying
10 information as to genealogy. As an initial process, the customer
11 enters the name being researched and receives a preliminary
12 report on the genealogy (the promotional material). To proceed
13 though, and get the actual data, the customer must pay to access
14 this further information.

15 To do so, the customer links with the payment processing
16 computer, and in the manner outlined above, receives back the
17 transaction indicia and the password. The payment processing
18 computer links the customer computer back to the merchant
19 computer; the customer provides the password to the merchant's
20 computer and is given access to the full genealogy report.

21 As outlined in this example, in the embodiment where a
22 password is used, the customer's computer uses the password with
23 the merchant's computer in obtaining access to protected
24 information or to establish shipping instructions.

25 The re-linking of the customer computer to the merchant
26 computer is accomplished in a variety of ways. In the preferred

1 embodiment, the payment processing computer obtains the
2 merchant's address or Unique Recognition Location (URL) from the
3 customer computer when the customer connects with the payment
4 processing computer. This URL is used in a variety of ways, to
5 identify the merchant, to establish the amount of the
6 product/service, and to establish the return URL when the payment
7 processing computer is done with its task for the customer
8 computer.

9 By selective use of the URL on the merchant's part, the URL
10 transmits a tremendous amount of information to the payment
11 processing computer. As example, assume the URL for the home-
12 page of the merchant is: <http://merchant.com/widget>.

13 When the merchant is selling a single product (a widget),
14 this URL is easy to match to the product. When the merchant
15 wants to sell a variety of widgets, then for a blue widget, the
16 URL might be: <http://merchant.com/widget/blue>.

17 In some embodiments, the customer's computer is not linked
18 back to the originating URL of the Merchant computer but rather
19 to another URL. The return URL is stored in the payment
20 processing computer and is used when the Merchant wants the
21 customer/consumer to be passed back to a different location (i.e.
22 where the restricted access information is accessible, or to
23 inform the consumer that their card has been rejected).

24 The invention, together with various embodiments thereof,
25 will be more fully explained by the accompanying drawings and the
26 following descriptions.

1 Drawings in Brief:

2 Figures 1A and 1B are block diagrams of the two computer
3 configurations used in the preferred embodiment.

4 Figure 1C is a graphical representation of the preferred
5 memory organization for the computer illustrated in figure 1A.

6 Figures 2A, 2B, 2C, 2D, and 2E graphically illustrate the
7 connections and disconnections of the preferred order.

8 Figures 3A, 3B, 3C, and 3D are frontal views of one
9 embodiment of a consumer's display screen.

10 Figure 4A is a flow-chart of the preferred embodiment's
11 payment processing operation.

12 Figure 4B is a flow-chart of an alternative embodiment's
13 payment processing operation.

14 Figure 5 is a flow-chart of the operation of the merchant's
15 computer.

1 Drawings in Detail:

2 Figures 1A and 1B are block diagrams of the two computer
3 configurations used in the preferred embodiment.

4 Figure 1A illustrates the configuration of the preferred
5 payment processing computer. As shown, computer 10A is a simple
6 layout of a Central-Processing-Unit (CPU) 11A which uses both
7 non-volatile memory 12A and Random-Access-Memory (RAM) 13A.

8 Communication to and from CPU 11A is via modem 14A which
9 communicates with other computers via the network connected by
10 phone line 15A.

11 Computer 10B, illustrated in figure 1B, shows the preferred
12 computer configuration used for the merchant computer and the
13 customer computer. Again, CPU 11B is connected to memories RAM
14 13B and non-volatile memory 12B. In the case of the merchant
15 computer, the promotional material is stored on non-volatile
16 memory 12B and is retrieved and communicated by CPU 11B using
17 modem 14B and phone line 15B.

18 This system is able to communicate with an operator via
19 monitor 16 for visual information. Monitor 16 is used for the
20 perusal of the promotional material by the customer.

21 Keyboard 17 is used to communicate operator commands to CPU
22 11B. In like fashion, mouse input device 18 is also used for
23 operator input to CPU 11B.

24 Optional printer 19 is used to create a hard copy of the
25 material being displayed to the operator/customer via monitor 16.

26 The differences between the computers shown in figure 1A and

1 1B are pronounce since the payment processing computer of figure
2 1A does not require input or direction from a human operator.
3 Rather, in the preferred embodiment, the payment processing
4 computer runs totally automatically and collects all of the data
5 and information it requires for its operation automatically from
6 the computers with which it is linked and with what is stored in
7 its memory.

8 Figure 1C is a graphical representation of the preferred
9 memory organization for the computer illustrated in figure 1A.

10 Memory 9, located preferably in non-volatile memory 12A, has
11 three sections. The first section 8A is the product listing
12 reference which is composed of multiple groupings. This data
13 remains relative constant and is defined by the merchant. Each
14 grouping, such as 7A, includes data identifying:

15 Part Number
16 Merchant Identification
17 Cost of Product/Service
18 Description of the Product/Service
19 Authorized Return URL
20 Rejected Return URL
21 Password

22 The second section is for defining the merchant's
23 information. Each grouping 7B within section 8B contains
24 relative constant information such as:

25 Merchant Identification
26 Business Name

1 Contact Name within the Business

2 Business Address

3 E-Mail address for the Business

4 Bank Checking Number for the Business

5 The third section 8C is an accounting listing which is
6 constantly up-graded as new payments are processed. This section
7 is used for making full accounting to the various merchants.

8 Grouping 7C within section 8C contain:

9 Transaction Number

10 Date of transaction

11 Amount of the transaction

12 Part number involved in transaction

13 Credit Card Number

14 Authorization Number

15 The authorization number is the indicia received from the
16 bank indicating that the credit card charge has been accepted.

17 The use of memory 9 allows the payment processing computer
18 to have access to the necessary information to handle the linkage
19 and perform the proper accounting.

20 Figures 2A, 2B, 2C, 2D, and 2E graphically illustrate the
21 connections and disconnections of the preferred order.

22 Referring to figure 2A, in a typical fashion, a consumer via
23 customer computer 21 enters the network 20 and searches through
24 various merchant computers until the consumer locates the
25 merchant of choice and connects with merchant computer 22.

26 Merchant computer 22 communicates the promotional material via

1 network 20 to customer computer 21.

2 When the consumer decides to buy the service or product from
3 merchant 22, as shown in figure 2B, the link with merchant
4 computer 22 is broken and customer computer 21 links with the
5 payment processing computer 23. In the change from merchant
6 computer 22 to payment processing computer 23, an indicia of the
7 URL or the product being promoted by merchant computer 22 is
8 communicated to the payment processing computer 23.

9 The indicia as a URL of the last site is available through
10 normal network operations and its handling is obvious to those of
11 ordinary skill in the art. The product number is easily
12 combined with the URL; thereby making the product number also
13 available to the payment processing computer 23.

14 In some embodiments, the originating URL is cross checked
15 to a memory data base to achieve the product number. In this
16 embodiment, the merchant structures its material so that only a
17 single product/service is associated with a specific URL.

18 Using the product number (or developing the product number
19 from the merchant's URL), the payment processing computer is able
20 to cross reference its own memory (as described earlier) to
21 achieve other important information including: the amount of the
22 product/service, a description of the product/service, the name
23 and address of the merchant, and other which will be used in
24 later operations.

25 The payment processing computer 23 accepts from the customer
26 computer 21, the credit card account number which is to be

1 debited the amount of the product.

2 As shown in figure 2C, in this embodiment, while maintaining
3 linkage with the customer computer 21, the payment processing
4 computer 23 establishes a link via phone lines 25 with the credit
5 card server computer 24. The credit card account number and
6 amount is communicated to the credit card server computer 24
7 which responds to the payment processing computer 23 with an
8 authorization indicia. This authorization indicia gives the
9 acceptance or denial of the charge.

10 If a product is to be shipped, and if the charge has been
11 authorized, as shown in figure 2D, the payment processing
12 computer 23 connects with the merchant computer 22 and directs
13 the merchant to ship the product to the consumer.

14 As shown in figure 2E, since the payment processing computer
15 23 has identified the product number, it is able to retrieve from
16 its memory the URL for reconnecting the customer computer 21 with
17 the merchant computer 22. In this manner, the entire operation
18 is totally transparent to the consumer since they feel they have
19 been continuously working with the merchant computer 22.

20 Further, using the URL's from its memory, the payment
21 processing computer 23 is able to link the customer computer 21
22 to the merchant computer 22 at an address which is different from
23 where the consumer was originally connected. In this manner, the
24 payment processing computer 23 is able to direct the consumer to
25 different locations which are consistent with the authorization
26 indicia (accept/reject) on their credit card.

1 As example, assume, the credit card was authorized, then the
2 consumer could be reconnected to an area which has restricted
3 access so that the consumer can gain the information paid for; if
4 on the other hand, the credit card was rejected, the connection
5 would be to a page indicating such and possibly asking for
6 another card number.

7 In this manner, the payment processing computer 23 is able
8 to control the operation and interface between the customer
9 computer 21 and the merchant computer 22.

10 Periodically, the payment processing computer 23 connects
11 via the phone lines 25 with the credit card server 24 and
12 instructs it to transfer the appropriate amount of funds to the
13 merchant's bank computer 26 so that the merchant has access to
14 the funds paid for his product/service provided to the consumer.

15 Figures 3A, 3B, 3C, and 3D are frontal views of one
16 embodiment of a consumer's display screen.

17 Screen 30A is designed to provide the promotional
18 information so that the consumer is attracted to purchase the
19 product. In screen 30A is the name of the merchant company (XYZ
20 CO.) 31, the name of the product (widget) 32, the price (\$14.95)
21 33, and the part number (#10234) 34.

22 Also located on screen 30A is a software key 35 which allows
23 the consumer to pay for the product. In this embodiment, by
24 activating this software key 35 (typically through a click of the
25 mouse), screen 30A is changed to screen 30B which is identical
26 except that the software key 35 has been replaced with an order

1 window 36.

2 Order window 36 allows the consumer to complete the
3 necessary information to order the product. This includes the
4 part number 37A, the amount 37B, and the credit card number 37C.
5 When the consumer is ready, the software key "Send" 37D or the
6 software key "Cancel" 37E is activated. In the case of a cancel,
7 the screen returns to screen 30A.

8 In a "send" 37D, mode, the payment processing computer
9 contacts the bank computer and determines if the credit card is
10 valid and if the amount is available. If the charge is
11 authorized, the screen changes to 30C in which the order window
12 36 has been replaced with authorization window 38 which shows
13 that the charge has been accepted 39A, the transaction no.
14 (A1483) 39B, and the password ("GO") 39C which the consumer is to
15 use with the merchant.

16 When this information has either been printed or committed
17 to memory, the consumer activates software key 39D to "Proceed"
18 to screen 30D. At this point, the consumer is able to enter the
19 password 29 so that the restricted access is lifted. In the
20 genealogy example, it is at this point the consumer gains access
21 to the full report.

22 Figure 4A is a flow-chart of the preferred embodiment's
23 payment processing operation.

24 After start 40A, a connection is made with the customer
25 computer 41A and the encryption software is downloaded to the
26 customer computer 41B. Encryption software is preferably used

1 for transmittal of the credit card number so that the integrity
2 of the card is not jeopardized.

3 The consumer computer then communicates, and the payment
4 processing computer accepts, the account number, the amount, and
5 the identification of the product or service, 42A. A connection
6 is made with the credit card server 41C and the account number
7 and amount is transmitted 41D to the credit card server over the
8 established phone lines. In response to this query, the
9 authorization data is received 42B and the connection with the
10 credit card server 41E is broken.

11 A transaction indicia is generated 41F. This transaction
12 indicia is not the authorization data but serves as an internal
13 monitoring system for the payment processing computer so that the
14 accounting is kept accurate.

15 From the memory, the password is withdrawn 41G for the
16 product so ordered; and, the password and transaction indicia is
17 transmitted to the customer computer 41H.

18 At this point, the connection with the customer computer is
19 terminated 41I and the program stops 40B.

20 Figure 4B is a flow-chart of an alternative embodiment's
21 payment processing operation.

22 After start 43A, the program connects with the customer
23 computer 44A and at the same time obtains the merchant URL 45A.
24 Using the merchant URL, the payment processing computer searches
25 its memory and identifies the merchant number, the part number,
26 and the purchase amount 44B.

1 The encryption software is downloaded into the customer
2 computer 44C and the credit card account number is received 45.
3 A connection is then made with the credit card server computer
4 44D and the account number and the amount is transmitted 44E.
5 This inquiry results in an authorization code 45C being received
6 and the connection with the credit card server being broken 44F.

7 A check is then made to see if the credit card purchase was
8 authorized 46A.

9 If the credit card purchase was denied, the URL to use for a
10 rejection is withdrawn from memory 44G and the Customer computer
11 is connected to the merchant computer at this URL 44H leaving the
12 payment processing computer able to disconnect 44I and stop 43B.

13 Should the credit card purchase be accepted, 46A, then the
14 program generates a transaction identification 44J. This
15 transaction identification is stored along with the date, amount
16 of purchase, and the merchant number 44K.

17 The password is retrieved from memory 44L and it, together
18 with the transaction identification, is transmitted to the
19 customer computer 44M.

20 From memory, the authorized URL is withdrawn 44N.

21 A determination, based upon stored data, is made as to the
22 character of the product (service or goods) 46B. If the product
23 relates to goods which are to be shipped, a shipping order
24 including the transaction identification, the amount, the date,
25 and address of the customer, is communicated to the merchant 44O
26 to satisfy the order. If the product is a "service", the program

1 skis to step 44P.

2 The customer computer is then connected to the authorized
3 URL 44P and the connection with the customer computer is
4 terminated 44Q allowing the program to stop 43C.

5 Figure 5 is a flow-chart of the operation of the merchant's
6 computer.

7 After start 50A, the merchant computer connects with the
8 customer computer 51A and communicates the promotional material
9 52A. The password is received from the customer 52B and is
10 checked to see if it is the correct password 53A.

11 If the password is incorrect, a determination is made on if
12 it is the customer's first try 53B; if it is, then the customer
13 is given another chance to enter the correct password 52B. If
14 the customer has tried twice to enter the correct password, the
15 connection with the customer is terminated 51C and the program
16 stops 50C.

17 If the password is correct, 53A, then the secure or
18 restricted access data is communicated to the customer's computer
19 51D and the connection with the customer's computer is terminated
20 51B. The program then stops 50B.

21 In this manner, secure information is selectively
22 transmitted to a customer's computer upon the presentation of a
23 password.

24 It is clear from the foregoing that the present invention
25 creates a highly improved system for acceptance and processing of
26 payments over a distributed computer network.